CISCO SYSTEMS

Release Notes for Cisco IOS Release 12.0(5)XK Feature Packs for Cisco MC3810

August 26, 1999

These release notes describe the Cisco IOS Release 12.0(5)XK feature packs for the Cisco MC3810 multiservice access concentrator and contain the following topics:

Introduction

How to Use These Release Notes

The tables in these release notes contain details about the Cisco feature packs. Use these tables to perform the following tasks before loading a software image on a router:

1. Use Table 1, "Cisco MC3810 Default Memory and Upgrade Options," for the feature set memory requirements, factory-default memory, and available memory upgrades for your Cisco MC3810.

2. Use Table 4, "Feature Pack Product Numbers Quick-Reference List," to identify the software image you want to load.

3. Use Table 5, "Cisco MC3810 Feature Packs," to identify your feature pack and the memory required for your feature set, based on the image you load.

4. Use the tables in the "Feature Set Tables" section on page 6 to identify which features are supported in a feature set image.

Feature Pack Components

A feature pack is a box that typically contains the following items:

- A CD-ROM with the following software:

    — Cisco IOS feature set software images that can include bundled modem firmware

    — Router Software Loader (RSL) program (a Windows 95 application) that loads images on your Cisco MC3810

    — Trivial File Transfer Protocol (TFTP) server application (for Windows 95 only)

- *Getting Started with the Router Software Loader*

    Note   If you cannot use RSL to load images, you can follow the instructions in the "Alternatives to RSL" section on page 16.

- Release notes (this document)

- Other configuration or command references, if available

- Software license for using Cisco software in object code form on a single access server or router

- Documentation CD-ROM that contains all Cisco documentation

System Requirements

This section describes the following topics:

- Memory Requirements, page 3

- Hardware Supported, page 3

- Software Compatibility, page 5

- Determining the Version of Your Software Release, page 5

- Upgrading to a New Software Release, page 5

- Product Numbers Quick-Reference List, page 5

- Feature Pack Overview Table, page 6

- Feature Set Tables, page 6

Memory Requirements

Table 1   Cisco MC3810 Default Memory and Upgrade Options

Memory Type	Defaults	Upgrade Options
Flash	8 MB	16 MB Flash, MEM-381-1X16F=
DRAM	32 MB	—

Hardware Supported

Cisco IOS Release 12.0(5)XK supports the Cisco MC3810 multiservice access concentrator. The Cisco MC3810 base chassis is a semi-fixed configuration router that can be customized at the factory for a specific application. The base chassis includes the following components:

- One fixed Ethernet LAN port

- A console port and an auxiliary port

- Two synchronous serial ports

- Five mounting areas for functional modules that support additional capabilities

- AC, DC, or redundant power supply

Cisco MC3810 series concentrators are supplied in various standard hardware configurations. These are equipped with different sets of functional modules to provide specific functional capability. Many configurations are possible, but they are all variations of the basic categories described in Table 2. Supported hardware is shown in Table 3. The chassis opening for any mounting area not equipped with a functional module is closed off with a removable cover plate.

Table 2   Cisco MC3810 Series Standard Hardware Categories

Category	Service Types Supported	Required Modules	Optional Modules
Base chassis	Base chassis services[1]	None	Optional modules can be added to create other chassis variations
Analog voice chassis	Base chassis services[1] plus compressed analog voice connections to telephone, fax, central office, analog PBX	AVM with 1 to 6 APMs VCM3 or VCM6	MFT[2] to support a channelized T1 or E1 trunk MFT[2] and VDM[3] to support video codec[4] dialing
Digital voice chassis	Base chassis services[1] plus compressed digital voice through digital PBX	DVM VCM3 and/or VCM6 (1 or 2 VCMs)	MFT[2] to support a channelized T1 or E1 trunk MFT[2] and VDM to support video codec dialing
BRI voice chassis	Base chassis services[1] plus compressed digital voice through PINX	BVM and MFT[1] VCM3 and/or VCM6 (1 or 2 VCMs)	MFT[2] and VDM[3] to support video codec dialing

Table 2   Cisco MC3810 Series Standard Hardware Categories (continued)

Category	Service Types Supported	Required Modules	Optional Modules
T1/E1 trunk chassis	Base chassis services[1] plus channelized T1 or E1	MFT[1]	DVM to support digital cross-connect voice (channel bank functionality/drop-and-insert) through digital PBX or channel bank
			VDM[3] to support video codec dialing
			VCM3 and/or VCM6 (1 or 2 VCMs) to support voice compression

1   Base chassis services include administrative access, Ethernet, data transport, and video transport.
2   The multiflex trunk module (MFT) is available with or without Basic Rate Interface (BRI) backup.
3   If a video dialing module (VDM) is installed, an MFT is required to support ATM for the video dialing network connection.
4   codec = coder-decoder.

Table 3   Hardware Supported on the Cisco MC3810 for Cisco IOS Release 12.0(5)T

Module or Other Hardware Option		Product Number
Voice Interface Modules	6-port AVM[1]	MC3810-AVM6
	1-port E1 DVM, connects to PBX/channel bank/key system[2]	MC3810-DVM-E1
	1-port T1 DVM, connects to PBX/channel bank/key system[2]	MC3810-DVM-T1
	1-port unbalanced E1 DVM, connects to PBX/channel bank/key system[2]	MC3810-DVM-BNC
	4-port BRI voice module[3]	MC3810-BVM4
Analog Personality Modules[4]	1-port E & M analog module	MC3810-APM-EM
	1-port FXS analog module	MC3810-APM-FXS
	1-port FXO analog module	MC3810-APM-FXO
	1-port FXO analog module, approved for the U.K.	MC3810-FXO-UK
	1-port FXO analog module, approved for Germany	MC3810-FXO-GER
	1-port FXO analog module, approved for PR2 countries	MC3810-FXO-PR2
	1-port FXO analog module, approved for PR3 countries	MC3810-FXO-PR3
Voice Compression Modules[5]	3-DSP VCM, supports up to 6 channels[6]	MC3810-VCM3
	6-DSP VCM, supports up to 12 channels[6]	MC3810-VCM6
Video Dialing Module	1-port VDM, RS-366[7]	MC3810-VDM
Multiflex Trunk Modules with Optional BRI	1-port MFT with RJ-48 channelized T1 interface	MC3810-MFT-T1
	1-port MFT with RJ-48 channelized E1 interface	MC3810-MFT-E1
	1-port MFT with unbalanced E1-BNC interface	MC3810-MFT-BNC
	1-port MFT with RJ-48 channelized T1 and BRI S/T interfaces	MC3810-MFT-TBS
	1-port MFT with unbalanced E1-BNC and BRI S/T interfaces	MC3810-MFT-EUS

1   Requires one to six analog personality modules (APMs) and one voice compression module (VCM3 or VCM6).
2   Requires one or two voice compression modules (VCM6) for processed voice.
3   Requires one voice compression module (VCM3 or VCM6) and Cisco IOS Release 12.0(4)T or a later release.
4   For use with analog voice modules (AVMs); one AVM requires at least one APM and supports up to six APMs.
5   Voice compression modules (VCMs) and Cisco IOS Plus feature sets are required for voice processing (for example, switching, compression, echo cancellation, and silence suppression) but not for drop-and-insert applications.
6   Cisco MC3810 maximum voice channel support by compression algorithm: G.711 at 64 kbps = 6 channels; G.726 at 32 kbps = 12 channels; G.729 at 8 kbps = 12 channels; G.729a at 8 kbps = 24 channels.
7   Supports ATM switched virtual circuits (SVCs) for video.

Software Compatibility

The feature packs described in these release notes contain Cisco IOS Release 12.0(5)XK software images, some images from previous software releases, and RSL Version 7.5.

Determining the Version of Your Software Release

To determine the version of Cisco IOS software running on your Cisco MC3810, log in to the device and enter the **show version** user EXEC command:

```
MC3810>show version
Cisco Internetwork Operating System Software
IOS (tm) MC3810 Software (mc3810-js-mz), Version 12.0(5)XK, RELEASE SOFTWARE
```

The output includes more information including processor revision numbers, memory amounts, hardware IDs, and partition information.

Upgrading to a New Software Release

For information about upgrading to a new software release, see the *Cisco IOS Software Release 12.0 T Upgrade (#819: 1/99)* product bulletin located on CCO at:

Service & Support: Product Bulletins: Software

Under **Cisco IOS 12.0**, click **Cisco IOS Software Release 12.0 T Upgrade (#819: 1/99)**.

See also the *Cisco IOS Software Release 12.0(5)XK (#949: 7/99)* product bulletin located on CCO at:

Service & Support: Product Bulletins: Software

Under **Cisco IOS 12.0**, click **Cisco IOS Software Release 12.0(5)XK (#949: 7/99)**.

Product Numbers Quick-Reference List

Table 4   Feature Pack Product Numbers Quick-Reference List

Product Number	Feature Pack Description
CD38-C-12.0.5=	Cisco MC3810 IP Feature Pack
CD38-CP-12.0.5=	Cisco MC3810 IP Plus Voice Feature Pack
CD38-AP-12.0.5=	Cisco MC3810 Enterprise Plus Voice Feature Pack
CD38-CM3P-12.0.5=	Cisco MC3810 IP Plus/ATM Voice Feature Pack
CD38-AM3P-12.0.5=	Cisco MC3810 Enterprise/ATM Plus Voice Feature Pack

Feature Pack Overview Table

Table 5   Cisco MC3810 Feature Packs

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD38-C-12.0(5)=	Cisco MC3810 IP Feature Pack Release 12.0(5)XK	mc3810-i-mz	aaa0806	4 MB[1]	16 MB[2]	Cisco MC3810 IOS IP Feature Set, Release 12.0(5)XK
CD38-CP-12.0(5)=	Cisco MC3810 IP Plus Voice Feature Pack Release 12.0(5)XK	mc3810-is-mz	aaa0807	8 MB	32 MB	Cisco MC3810 IOS IP Plus Feature Set, Release 12.0(5)XK
CD38-AP-12.0(5)=	Cisco MC3810 Enterprise Plus Voice Feature Pack Release 12.0(5)XK	mc3810-js-mz	aaa0808	8 MB	32 MB	Cisco MC3810 IOS Enterprise Plus Feature Set, Release 12.0(5)XK
CD38-CM3P-12.0(5)=	Cisco MC3810 IP Plus/ATM Voice Feature Pack Release 12.0(5)XK	mc3810-a2is-mz	aaa0809	8 MB	32 MB	Cisco MC3810 IOS IP/ATM Plus Feature Set, Release 12.0(5)XK
CD38-AM3P-12.0(5)=	Cisco MC3810 Enterprise/ATM Plus Voice Feature Pack Release 12.0(5)XK	mc3810-a2js-mz	aaa0810	8 MB	32 MB	Cisco MC3810 IOS Enterprise/ATM Plus Feature Set, Release 12.0(5)XK

1   Required Flash memory for the IP feature set: the standard configuration includes 8 MB of Flash memory.
2   Required DRAM for the IP feature set: the standard configuration includes 32 MB of DRAM.

Feature Set Tables

Cisco IOS software is packaged in feature sets consisting of software images—depending on the platform. Each feature set contains a specific set of Cisco IOS features.

Table 6 lists the Cisco IOS software feature sets available for the Cisco MC3810 in Cisco IOS Release 12.0(5)XK.

Release 12.0 T supports the same feature sets as Release 12.0, but Release 12.0 T can include new features supported by the Cisco MC3810.

Table 6   Feature Sets Supported by the Cisco MC3810

Feature Sets	Feature Set Matrix Term	Software Image
IP Standard Feature Sets	IP	mc3810-i-mz
	IP Plus	mc3810-is-mz
	IP/ATM Plus	mc3810-a2is-mz
Enterprise Standard Feature Sets	Enterprise Plus	mc3810-js-mz
	Enterprise ATM Plus	mc3810-a2js-mz

⚠ **Caution** Cisco IOS images with strong encryption (including, but not limited to, 56-bit data encryption feature sets) are subject to United States government export controls and limited distribution. Images to be installed outside the United States require an export license. Customer orders may be denied or subject to delay because of United States government regulations. Contact your sales representative or distributor for more information, or send e-mail to export@cisco.com.

Table 7 lists the features and feature sets supported by the Cisco MC3810 in Cisco IOS Release 12.0(5)XK and uses the following conventions:

- Yes—The feature is supported in the software image.

- No—The feature is not supported in the software image.

Note This feature set table contains only a selected list of features. This table is not cumulative—nor does it list all the features in each image.

Table 7   Feature List by Feature Set for the Cisco MC3810

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
ATM Access					
Frame Relay–ATM Interworking (FRF.5)	No	No	Yes	No	Yes
PPP over ATM	No	No	Yes	No	Yes
RFC 1483	No	No	Yes	No	Yes
rtVBR, nrtVBR, CBR, UBR	No	No	Yes	No	Yes
Structured CES[1]	No	No	Yes	No	Yes
Traffic Shaping	No	No	Yes	No	Yes
UNI 3.1[2]	No	No	Yes	No	Yes
UNI 4.0 (with ILMI)	No	No	Yes	No	Yes
IBM Support					
APPN	No	No	No	No	No
APPN High-Performance Routing	No	No	No	No	No
APPN MIB Enhancements	No	No	No	No	No
APPN over Ethernet LAN Emulation	No	No	No	No	No
APPN Scalability Enhancements	No	No	No	No	No
BAN for SNA Frame Relay Support	No	Yes	Yes	Yes	Yes
Bisync	No	Yes	Yes	Yes	Yes
Bridging Code Rework	No	No	No	No	No
Caching and Filtering	Yes	Yes	Yes	Yes	Yes
DLSw+	No	Yes	Yes	Yes	Yes
DLSw+ Enhanced Load Balancing	No	Yes	Yes	Yes	Yes
DLSw+ Ethernet Redundancy	No	Yes	Yes	Yes	Yes
DLSw+ Peer Clusters	No	Yes	Yes	Yes	Yes

Table 7 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
DLSw (RFC 1795)	No	Yes	Yes	Yes	Yes
DLSw+ RSVP	No	Yes	Yes	Yes	Yes
DLSw+ RSVP Bandwidth Reservation	No	Yes	Yes	Yes	Yes
DLSw Version 2 (RFC 1266)	No	Yes	Yes	Yes	Yes
Downstream PU Concentration (DSPU)	No	Yes	Yes	Yes	Yes
Frame Relay SNA Support (RFC 1490)	No	Yes	Yes	Yes	Yes
NCIA	No	Yes	Yes	Yes	Yes
NetView Native Service Point	No	Yes	Yes	Yes	Yes
Polled Async	No	Yes	Yes	Yes	Yes
QLLC	No	Yes	Yes	Yes	Yes
Response Time Reporter	No	Yes	Yes	Yes	Yes
RIF Passthru in DLSw+	No	Yes	Yes	Yes	Yes
SDLC Integration	No	Yes	Yes	Yes	Yes
SDLC Transport (STUN)	No	Yes	Yes	Yes	Yes
SDLC-to-LAN Conversion (SDLLC)	No	Yes	Yes	Yes	Yes
SNA and NetBIOS WAN Optimization	No	Yes	Yes	Yes	Yes
SRB/RSRB	No	Yes	Yes	Yes	Yes
SRT	No	No	No	No	No
SRTLB	No	Yes	Yes	Yes	Yes
TG/COS	No	No	No	No	No
TN3270	No	No	No	Yes	Yes
TN3270 LU Nailing	No	Yes	Yes	Yes	Yes
TN3270 Server Enhancements	No	Yes	Yes	Yes	Yes
IP Routing					
BGP	Yes	Yes	Yes	Yes	Yes
BGP4	Yes	Yes	Yes	Yes	Yes
EGP	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP Optimizations	Yes	Yes	Yes	Yes	Yes
ES-IS	No	No	No	Yes	Yes
GRE VPN	No	No	No	Yes	Yes
IGRP	Yes	Yes	Yes	Yes	Yes
IS-IS	No	No	No	Yes	Yes
Named IP Access Control List	Yes	Yes	Yes	Yes	Yes
Network Address Translation (NAT)	Yes	Yes	Yes	Yes	Yes
NHRP	Yes	Yes	Yes	Yes	Yes

Table 7 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
On Demand Routing	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes
OSPF Not-So-Stubby-Areas (NSSA)	Yes	Yes	Yes	Yes	Yes
OSPF On Demand Circuit (RFC 1793)	Yes	Yes	Yes	Yes	Yes
Protocol-Independent Multicast (PIM)	Yes	Yes	Yes	Yes	Yes
PIM Version 2	Yes	Yes	Yes	Yes	Yes
Policy-Based Routing	Yes	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes	Yes
RIP Version 2	Yes	Yes	Yes	Yes	Yes
LAN Support					
Apollo Domain	No	No	No	Yes	Yes
AppleTalk Phase 2	No	No	No	Yes	Yes
Banyan VINES	No	No	No	Yes	Yes
Concurrent Routing and Bridging	Yes	Yes	Yes	Yes	Yes
DECnet IV	No	No	No	Yes	Yes
DECnet V	No	No	No	Yes	Yes
GRE	No	No	No	Yes	Yes
Integrated Routing and Bridging (IRB)	Yes	Yes	Yes	Yes	Yes
IP	Yes	Yes	Yes	Yes	Yes
LAN Extension Host	No	No	No	No	No
Multiring	No	No	No	No	No
Novell IPX	No	No	No	Yes	Yes
OSI	No	No	No	Yes	Yes
Source-Route Bridging	Yes	Yes	Yes	Yes	Yes
Transparent and Translational Bridging	Yes	Yes	Yes	Yes	Yes
VLANs (ISL & IEEE 802.10)	No	No	No	Yes	Yes
XNS	No	No	No	Yes	Yes
Management					
AutoInstall	Yes	Yes	Yes	Yes	Yes
Automatic Modem Configuration	Yes	Yes	Yes	Yes	Yes
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes
CLI String Search	Yes	Yes	Yes	Yes	Yes
HTTP Server	Yes	Yes	Yes	Yes	Yes
Response Time Reporter Enhancements	Yes	Yes	Yes	Yes	Yes
RMON Events and Alarms	No	No	No	No	No
RMON Full	No	No	No	No	No
Service Assurance Agent	Yes	Yes	Yes	Yes	Yes

Table 7   Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
SNMP	Yes	Yes	Yes	Yes	Yes
SNMP Inform Request	Yes	Yes	Yes	Yes	Yes
SNMP version 3	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
VPDN MIB Feature	Yes	Yes	Yes	Yes	Yes
Multimedia and Quality of Service					
Application Specific Routing	No	No	No	No	No
Generic Traffic Shaping	Yes	Yes	Yes	Yes	Yes
H.323 Gatekeeper and Proxy	No	No	No	No	No
H.323 Hot Standby Routing Protocol (HSRP)	No	No	No	No	No
Multicast Routing Monitor	Yes	Yes	Yes	Yes	Yes
Multimedia Conference Manager	No	No	No	No	No
PGM Router Assist	Yes	Yes	Yes	Yes	Yes
Process MIB	Yes	Yes	Yes	Yes	Yes
Random Early Detection (RED)	Yes	Yes	Yes	Yes	Yes
Response Time Reporter Enhancements	Yes	Yes	Yes	Yes	Yes
RSVP	Yes	Yes	Yes	Yes	Yes
Other Routing					
AURP	No	No	No	Yes	Yes
IPX RIP	No	No	No	Yes	Yes
NLSP	No	No	No	Yes	Yes
RTMP	No	No	No	Yes	Yes
SMRP	No	No	No	Yes	Yes
SRTP	No	No	No	Yes	Yes
Protocol Translation					
LAT	No	No	No	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
Rlogin	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
TN3270	No	No	No	Yes	Yes
X.25	Yes	Yes	Yes	Yes	Yes
Remote Node					
ARAP 1.0/2.0	No	No	No	Yes	Yes
Asynchronous Master Interfaces	Yes	Yes	Yes	Yes	Yes
ATCP	No	No	No	Yes	Yes
CPPP	Yes	Yes	Yes	Yes	Yes
CSLIP	Yes	Yes	Yes	Yes	Yes

Table 7 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
DHCP	Yes	Yes	Yes	Yes	Yes
IP Pooling	Yes	Yes	Yes	Yes	Yes
IPX and ARAP on Virtual Async Interfaces	No	No	No	Yes	Yes
IPXCP	No	No	No	Yes	Yes
MacIP	No	No	No	Yes	Yes
NASI	No	No	No	Yes	Yes
NetBEUI over PPP	No	No	No	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SLIP	Yes	Yes	Yes	Yes	Yes
Scalability					
Airline Product Set (ALPS)	No	No	No	No	No
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes
Cisco MC3810 – IGX 8400 Interworking	No	Yes	Yes	Yes	Yes
Entity MIB	Yes	Yes	Yes	Yes	Yes
Expression MIB	Yes	Yes	Yes	Yes	Yes
OSPF Point to Multipoint	Yes	Yes	Yes	Yes	Yes
Per Port Debugging (Conditionally Triggered Debugging)	Yes	Yes	Yes	Yes	Yes
Priority Queuing Support Enhancement for Cisco MC3810-IGX Interworking	No	Yes	Yes	Yes	Yes
SNMP Manager	Yes	Yes	Yes	Yes	Yes
Security					
Access Lists	Yes	Yes	Yes	Yes	Yes
Access Security	Yes	Yes	Yes	Yes	Yes
Additional Vendor-Proprietary RADIUS Attributes	Yes	Yes	Yes	Yes	Yes
Authenticating ACLs	No	No	No	No	No
Automated Double Authentication	No	No	No	Yes	Yes
Certificate Authority Interoperability	No	No	No	No	No
Context-Based Access Control (CBAC)	No	No	No	No	No
Extended Access Lists	Yes	Yes	Yes	Yes	Yes
Internet Key Exchange Security Protocol	No	No	No	No	No
IPSec Network Security	No	No	No	No	No
Kerberized Login	No	No	No	Yes	Yes
Kerberos V Client Support	No	No	No	Yes	Yes
Lock and Key	Yes	Yes	Yes	Yes	Yes
MAC Security for Hubs	Yes	Yes	Yes	Yes	Yes

Table 7   Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	**IP Plus**	**IP/ATM Plus**	**Enterprise Plus**	**Enterprise ATM Plus**
Md5 Routing Authentication	Yes	Yes	Yes	Yes	Yes
MS-CHAP Support	No	No	No	Yes	Yes
Named Method Lists for AAA Authentication & Accounting	Yes	Yes	Yes	Yes	Yes
Network Layer Encryption (40-bit or Export Controlled 56-bit DES)	No	No	No	No	No
RADIUS	Yes	Yes	Yes	Yes	Yes
Router Authentication	No	No	No	No	No
Sublock Phase 1	Yes	Yes	Yes	Yes	Yes
TACACS+	Yes	Yes	Yes	Yes	Yes
Time-Based Access Lists	Yes	Yes	Yes	Yes	Yes
Tunneling Endpoint Discovery	No	No	No	Yes	Yes
Switching					
Enhanced ATM VC Configuration and Management	No	No	Yes	No	Yes
Multiple ISDN Switch Types	Yes	Yes	Yes	Yes	Yes
Terminal Services					
LAT	No	No	No	Yes	Yes
Rlogin	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
TN3270	No	No	No	Yes	Yes
X.25 Pad	Yes	Yes	Yes	Yes	Yes
Xremote	No	No	No	Yes	Yes
Voice and Multimedia					
Analog Signaling	No	Yes	Yes	Yes	Yes
Call Detail Records (CDR)	No	Yes	Yes	Yes	Yes
E1 CAS Signaling[3]	No	Yes	Yes	Yes	Yes
Fancy Queuing on Frame Relay or Cisco HDLC	Yes	Yes	Yes	Yes	Yes
G.726 (ADPCM)	No	Yes	Yes	Yes	Yes
Gain Control	No	Yes	Yes	Yes	Yes
ISDN BRI Voice Module	No	Yes	Yes	Yes	Yes
ISDN PRI QSIG Digit Forwarding	No	Yes	Yes	Yes	Yes
ISDN PRI QSIG Voice Signaling	No	Yes	Yes	Yes	Yes
Local Dialing	No	Yes	Yes	Yes	Yes
Local Voice Busy Out	No	Yes	Yes	Yes	Yes
Multiple Ring Tones	No	Yes	Yes	Yes	Yes
Multiflex Trunk	Yes	Yes	Yes	Yes	Yes
Multi-length Dial Patterns	No	Yes	Yes	Yes	Yes

Table 7   Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
Off-Net Dialing	No	Yes	Yes	Yes	Yes
On-Net/Off-Net Call Rerouting	No	Yes	Yes	Yes	Yes
OPX Ring-Through	No	Yes	Yes	Yes	Yes
Pass-Through Voice	Yes	Yes	Yes	Yes	Yes
Permanent Connection	No	Yes	Yes	Yes	Yes
PLAR	No	Yes	Yes	Yes	Yes
Preference-based Hunt Groups	No	Yes	Yes	Yes	Yes
Remote Dialing	No	Yes	Yes	Yes	Yes
T1 CAS Signaling	No	Yes	Yes	Yes	Yes
Transparent CCS	No	Yes	Yes	Yes	Yes
Voice Activity Detection	No	Yes	Yes	Yes	Yes
Voice over ATM	No	No	Yes	No	Yes
Voice over Frame Relay	No	Yes	Yes	Yes	Yes
Voice over Frame Relay Using FRF.11 and FRF.12	No	Yes	Yes	Yes	Yes
Voice over HDLC	No	Yes	Yes	Yes	Yes
Voice over IP	No	No	No	No	No
WAN Optimization					
Bandwidth-on-Demand	Yes	Yes	Yes	Yes	Yes
Custom and Priority Queuing[4]	Yes	Yes	Yes	Yes	Yes
Dial Backup	Yes	Yes	Yes	Yes	Yes
Dial-on-Demand	Yes	Yes	Yes	Yes	Yes
DRP Server Agent	Yes	Yes	Yes	Yes	Yes
Header, Link, and Payload Compression	Yes	Yes	Yes	Yes	Yes
Snapshot Routing	Yes	Yes	Yes	Yes	Yes
Weighted Fair Queuing[4]	Yes	Yes	Yes	Yes	Yes
WAN Services					
Always On/Direct ISDN	No	No	No	No	No
ATM LAN Emulation: Decnet Routing and Banyan Vines Support	No	No	Yes	No	Yes
ATM LAN Emulation: (HSRP and SSRP)	No	No	Yes	No	Yes
ATM: Rate Queues for SVC per Subinterface	No	No	Yes	No	Yes
ATM: UNI 3.1 Signaling for ATM	No	No	Yes	No	Yes
ATM: UNI 4.0	No	No	Yes	No	Yes
Combinet Packet Protocol (CPP)	No	No	No	No	No
Dialer Profiles	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes

Table 7   Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
Facility Data Link Capabilities on Multiflex Trunk	Yes	Yes	Yes	Yes	Yes
Frame Relay Compression (FRF.9)	Yes	Yes	Yes	Yes	Yes
Frame Relay End-to-End Keepalive	Yes	Yes	Yes	Yes	Yes
Frame Relay SVCs Support (DTE)	No	No	No	No	No
Frame Relay Traffic Shaping	Yes	Yes	Yes	Yes	Yes
Frame Relay Switching	Yes	Yes	Yes	Yes	Yes
Frame Relay UNI	Yes	Yes	Yes	Yes	Yes
Frame Relay–ATM Interworking (FRF.5)	No	No	Yes	No	Yes
Half Bridge/Half Router For CPP And PPP	Yes	Yes	Yes	Yes	Yes
HDLC	Yes	Yes	Yes	Yes	Yes
Integrated BRI Backup[5]	Yes	Yes	Yes	Yes	Yes
IPXwan 2.0	No	No	No	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes
ISDN Advise of Charge	Yes	Yes	Yes	Yes	Yes
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes
ISDN NFAS	Yes	Yes	Yes	Yes	Yes
Leased Line ISDN at 128 kbps	No	No	No	No	No
MPPC-MS PPP Compression	Yes	Yes	Yes	Yes	Yes
MS Callback	No	No	No	No	No
Multichassis Multilink PPP (MMP)	No	No	No	Yes	Yes
National ISDN Switch Type	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	Yes	Yes	Yes
Stackable Home Gateway	No	No	No	No	No
Switched 56	Yes	Yes	Yes	Yes	Yes
Virtual Private Dialup Network (VPDN)	No	No	No	Yes	Yes
X.25	Yes	Yes	Yes	Yes	Yes
X.25 Enhancements	Yes	Yes	Yes	Yes	Yes
X.25 on ISDN	Yes	Yes	Yes	Yes	Yes
X.25 over Frame Relay (Annex G)	Yes	Yes	Yes	Yes	Yes
X.25 Switching between PVCs and SVCs	Yes	Yes	Yes	Yes	Yes

1   Voice signaling on circuit emulation service (CES) is not available.
2   ATM permanent virtual circuits (PVCs) only. Switched virtual circuits (SVCs) are not supported.
3   Includes T1 channel associated signaling (CAS) protocols, plus UK Standard CAS (Mercury protocol) and Conférence Européenne des Postes et des Télécommunications (CEPT) standard receive and transmit (E&M).
4   Applicable to data-only interfaces.
5   When the older motherboard (SCB 6.06) is used with this feature, serial port 1 cannot be used. When the new motherboard (SCB 6.07) is used, serial port 1 can be used, clocked at speeds up to 192 kbps.

Installation Notes

This section describes the following topics:

- Image Installation Tips and Troubleshooting When Using RSL, page 15

- Alternatives to RSL, page 16

Image Installation Tips and Troubleshooting When Using RSL

Image Installation Tips

The following information about RSL operations can help you with the installation process:

- If you are loading software on a preconfigured router, save the router configuration file on your PC before running RSL.

- If you have added any static entries to the PC Address Resolution Protocol (ARP) table, one or more of them may be deleted by RSL. Manually re-enter any deleted entries in the PC ARP table.

- During a connection, if the router's running configuration is not the same as its startup configuration, the exact configuration is not restored. Any changes that you made since the last time you entered **copy running-config startup-config** or **write memory** commands are lost.

- RSL restores the router's startup configuration, but some running configuration commands are not restored. To restore the exact running configuration, reboot the router. The following interface configuration commands are not restored to the running configuration:

  — **no shutdown**

  — **no ringspeed**

  — **media-type aui**

Recovering from a Connection Error

If any of the following elements apply to your installation, modify the Short Timeout value from the Options dialog box in RSL:

- You are connecting to a router or access server that has a large configuration file.

- You are connecting to a Cisco AS5200 access server.

- You see the following error message:

```
"Failed to configure the router to enable the Cisco IOS software image and
configuration file upload and download operations. You may want to check the router to
make sure that the selected interface exists."
```

If you are connecting to a Cisco AS5200, increase the Short Timeout value to 60 seconds. The Cisco AS5200 requires up to 45 seconds to write a configuration to nonvolatile random-access memory (NVRAM) due to the number of interfaces it must check during this process.

If you are connecting to any other router or access server, increase the Short Timeout value to more than 25 seconds.

Note If you change the timeout value, you must do so before connecting to the device, or the new value will not be used. Also, increasing the Short Timeout value can increase the time it takes for RSL to connect to the target device.

Restoring the Startup Configuration

In some cases, RSL is unable to restore the startup configuration. If this happens, follow these steps:

Step 1   Ensure that all cables are properly attached to both the router and the PC.

Step 2   Restart RSL and connect by using the **Preconfigured router** option.

Step 3   When asked if you want to overwrite the existing startup configuration file, choose **no**.

Step 4   When asked if you want to continue, choose **yes**.

Step 5   When the router is connected, select **Download Router Configuration** in the Router Software Loader dialog box.

Step 6   Select the appropriate file and click **Copy configuration to the router nonvolatile memory**. The router should now contain the startup configuration it had before the initial RSL connection.

Step 7   Exit RSL.

Note   In the steps above, the router configuration register (**config-register 0x***nnnn*) is not restored.

Note   If you press **Ctrl-Alt-Delete** to quit RSL, the router configuration and the configuration register are not restored. However, the configuration file is not deleted from the PC. To restore the configuration file, follow the steps above, beginning with Step 2.

Alternatives to RSL

RSL is designed to work with a PC running Microsoft Windows 95 and is the recommended method for downloading software to the router; however, two alternatives are available for installing router software:

- Installing the Router Software by Using the Console
- Installing the Router Software by Using a TFTP Server Application

---

Note   The sample prompts and output shown in the following sections may not be identical to the prompts displayed on the Cisco MC3810 console.

Installing the Router Software by Using the Console

This section explains how to use the **copy xmodem flash** command to install the router software from the CD-ROM onto the router.

The following example shows how to use the **copy xmodem flash** command on a Cisco MC3810:

```
Router# copy xmodem flash
                        **** WARNING ****
    x/ymodem is a slow transfer protocol limited to the current speed
    settings of the auxiliary/console ports. The use of the auxiliary
    port for this download is strongly recommended.
    During the course of the download no exec input/output will be
    available.
                        ---- ******* ----
    Proceed? [confirm] yes
    Use crc block checksumming? [confirm] yes
```

```
Max Retry Count [10]:
Perform image validation checks? [confirm] yes
Xmodem download using crc checksumming with image validation
Continue? [confirm] yes
Partition   Size     Used      Free      Bank-Size  State        Copy Mode
   1       4096K    3259K      836K      4096K      Read/Write   Direct
   2       4096K      0K      4095K      4096K      Read/Write   Direct

[Type ?<no> for partition directory; ? for full directory; q to abort]
Which partition? [default = 1] 2

System flash directory, partition 2:
File  Length   Name/status
  1     68       TESTFILE
[132 bytes used, 4194172 available, 4194304 total]
Destination file name? mc3810-i-mz
Erase flash device before writing? [confirm] yes
Flash contains files. Are you sure you want to erase? [confirm] yes

Copy '' from server
  as 'c3620-i-mz.0918' into Flash WITH erase? [yes/no] yes
Erasing device... eeeeeeeeeeeeeeee ...erased
Ready to receive file...........C
Verifying checksum...  OK (0x5DE8)
Flash device copy took 00:12:06 [hh:mm:ss]
```

Installing the Router Software by Using a TFTP Server Application

Use this TFTP server application method as an alternative method to install the router software from the CD-ROM. You can perform this procedure by using a PC (running Microsoft Windows 95 or Microsoft Windows 3.1), a Macintosh, or a UNIX system. You can use either the **copy tftp flash** or **copy rcp flash** command to download the router software to the router.

First, obtain a TFTP application or a remote copy protocol (rcp) application to set up your computer as a TFTP server or an rcp server. If you are using a PC running Windows 95, you can use RSL or the TFTP server included on the feature pack CD-ROM to install the router software. For other operating systems, a number of TFTP or rcp applications are available from independent software vendors or as shareware on the World Wide Web.

Note   To use an rcp application, follow the same procedure below, but substitute "rcp" for "TFTP" and use the **copy rcp flash** command instead of the **copy tftp flash** command.

Step 1   Install any TFTP server application on the PC. (A PC application is included on the feature pack CD-ROM for Microsoft Windows 95 only.)

Step 2   Start the TFTP server application on the PC by double-clicking the application icon or its .exe filename.

Step 3   Set up the PC as a TFTP server by using the TFTP server application setup or configuration facility.

Most TFTP server applications include a setup facility that allows you to specify the PC as a server. For example, from the TFTP menu of one application, select **Settings** to display a panel. To configure the local PC as a server, click the **Server** check box.

Select a root directory where the Cisco IOS files reside (for example, d:\cpswinst\images).

⚠ **Caution** Make sure you set up your local PC as a TFTP server. If you do not, you cannot perform the copy procedure. This caution applies to both TFTP and rcp.

Step 4 Establish a console session from your local PC (which is now configured as a TFTP server) to the Cisco router by using one of these methods:

- Connect the PC com port to the router console port.

  This is the recommended method. When you reload the router with the new image in Step 10, you remain connected to the router.

- Establish a Telnet session from the PC to the router. If you choose to use Telnet, your connection to the router will be lost when it is reloaded.

⚠ **Caution** Make sure that your PC is set up to communicate with the connected device through its network port.

Step 5 Connect your PC's LAN port to the corresponding LAN port on the router. If you are making a direct connection to the router via Ethernet or Fast Ethernet, use an Ethernet crossover cable. If connecting to the router via an Ethernet or Fast Ethernet hub or Token Ring MAU (hub), use straight-through cable.

> **Note** Cisco recommends that you back up the router configuration before upgrading the router software.

Step 6 At the prompt, enter the IP address of your PC, as shown in the following example:

```
Address or name of remote host [255.255.255.255]? 131.108.1.1
```

This is the IP address of your local PC, not that of the router.

Step 7 At the prompt, enter the filename of the Cisco IOS Release 12.0(5)T image to be copied to the router, as shown in the following example:

```
Source file name? aaa0806.bin
```

This example specifies the DOS image name of the IP feature set for the Cisco MC3810 (as shown in Table 5 in the "Feature Pack Overview Table" section on page 6).

Step 8 At the prompt, enter the destination UNIX image filename and press **Enter**.

This is the name of the image file on the router—not the full path name of the image on the CD-ROM attached to the PC. Refer to Table 5 in the "Feature Pack Overview Table" section on page 6 for the UNIX image filename.

```
Destination file name [aaa0806.bin]? mc3810-i-mz.120-5.XK
```

During the transfer process, the software displays messages indicating that it has accessed the file you have specified and is loading it.

Step 9 At the prompt, enter **yes** if you want to erase the existing image copy resident in the router Flash memory before copying the new one:

```
Erase flash device before writing? [confirm] yes
```

The entire copying process takes several minutes and differs from network to network.

The exclamation point (!) indicates that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully. A checksum verification of the image occurs after the image is written to Flash memory.

Step 10 Enter the **reload** command to reload the router:

```
Router# reload
```

After the reload is complete, the router should be running the required Cisco IOS image. Use the **show version** command to verify it.

Related Documentation

The following sections describe the documentation available for the Cisco MC3810. These documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online on CCO and the Documentation CD-ROM only.

Use these release notes with these documents:

- Release-Specific Documents, page 19
- Platform-Specific Documents, page 20
- Feature Modules, page 20
- Cisco IOS Documentation Set, page 21

Release-Specific Documents

The following documents are specific to Release 12.0. They are located on CCO and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.0*

  You can reach this document on CCO at:

  Service & Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

  You can reach this document on the Documentation CD-ROM at:

  Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

- Product bulletins, field notices, and other release-specific documents

  You can reach these documents on CCO at:

  Service & Support: Technical Documents

- *Caveats for Cisco IOS Release 12.0 T*

For caveat details, see the *Caveats for Cisco IOS Release 12.0 T* document, which contains caveats applicable to all platforms for all maintenance releases of Release 12.0 T.

You can reach the caveats document on CCO at:

Service & Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Caveats: Caveats for Cisco IOS Release 12.0 T

You can reach the caveats document on the Documentation CD-ROM at:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Caveats: Caveats for Cisco IOS Release 12.0 T

Note   If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II at http://www.cisco.com/support/bugtools.

Platform-Specific Documents

The following documents are available for the Cisco MC3810 on CCO and the Documentation CD-ROM:

- *Cisco MC3810 Multiservice Access Concentrator Hardware Installation Guide*
- *Quick Start Guide: Cisco MC3810 Multiservice Access Concentrator Installation and Startup*
- *Cisco MC3810 Multiservice Access Concentrator Regulatory Compliance and Safety Information*
- *Installing and Removing Field-Replaceable Units in the Cisco MC3810 Multiservice Access Concentrator*
- *Cisco MC3810 Multiservice Access Concentrator Software Configuration Guide*

You can reach Cisco MC3810 documentation on CCO at:

Service & Support: Technical Documents: Documentation Home Page: Access Servers and Access Routers: Multiservice Access Concentrators

You can reach Cisco MC3810 documentation on the Documentation CD-ROM at:

Cisco Product Documentation: Access Servers and Access Routers: Multiservice Access Concentrators

Feature Modules

Feature modules describe new features supported by Release 12.0 T and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the features modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

You can reach the feature modules on CCO at:

Service & Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation

You can reach the feature modules on the Documentation CD-ROM at:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation

Cisco IOS Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents, which are shipped with your order in electronic form on the Documentation CD-ROM—unless you specifically ordered the printed versions.

Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

You can reach these documents on CCO at:

Service & Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

You can reach these documents on the Documentation CD-ROM at:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

Release 12.0 Documentation Set

Table 8 describes the contents of the Cisco IOS Release 12.0 software documentation set, which is available in electronic form and also in printed form upon request.

Note You can find the most current Cisco IOS documentation on CCO and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the paper documents were printed.

You can reach the Cisco IOS documentation set on CCO at:

Service & Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0

You can reach the Cisco IOS documentation set on the Documentation CD-ROM at:

Cisco IOS Software Configuration: Cisco IOS Release 12.0

Table 8   Cisco IOS Software Release 12.0 Documentation Set

Books	Chapter Topics
• *Configuration Fundamentals Configuration Guide* • *Configuration Fundamentals Command Reference*	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management

Table 8   Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
• *Bridging and IBM Networking Configuration Guide* • *Bridging and IBM Networking Command Reference*	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN Cisco Database Connection NCIA Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set
• *Dial Solutions Configuration Guide* • *Dial Solutions Command Reference*	Dial-In Port Setup Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions ISDN X.25 over ISDN VPDN Dial Business Solutions and Examples
• *Cisco IOS Interface Configuration Guide* • *Cisco IOS Interface Command Reference*	Interface Configuration Overview
• *Network Protocols Configuration Guide, Part 1* • *Network Protocols Command Reference, Part 1*	IP Addressing IP Services IP Routing Protocols
• *Network Protocols Configuration Guide, Part 2* • *Network Protocols Command Reference, Part 2*	AppleTalk Novell IPX
• *Network Protocols Configuration Guide, Part 3* • *Network Protocols Command Reference, Part 3*	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
• *Security Configuration Guide* • *Security Command Reference*	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
• *Cisco IOS Switching Services Configuration Guide* • *Cisco IOS Switching Services Command Reference*	Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing

Table 8   Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
• *Wide-Area Networking Configuration Guide* • *Wide-Area Networking Command Reference*	ATM Frame Relay SMDS X.25 and LAPB
• *Voice, Video, and Home Applications Configuration Guide* • *Voice, Video, and Home Applications Command Reference*	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Video Support Universal Broadband Features
• *Quality of Service Solutions Configuration Guide* • *Quality of Service Solutions Command Reference*	Classification Scheduling Packet Drop Traffic Shaping ATM QoS SNA QoS Line Protocols
• *Cisco IOS Software Command Summary* • *Dial Solutions Quick Configuration Guide* • *System Error Messages* • *Debug Command Reference*	

Note   The *Cisco Management Information Base (MIB) User Quick Reference* publication is no longer published. For the latest list of MIBs supported by Cisco, see the Cisco Network Management Toolkit on Cisco Connection Online. From CCO, click on the following path: **Service & Support**: **Software Center**: **Network Mgmt Products**: **Cisco Network Management Toolkit**: **Cisco MIBs**.

Service and Support

For service and support for a product purchased from a reseller, contact the reseller, who offers a wide variety of Cisco service and support programs described in "Service and Support" of the *Cisco Information Packet* that shipped with your product.

Note   If you purchased your product from a reseller, you can access CCO as a guest. CCO is Cisco Systems' primary real-time support channel. Your reseller offers programs that include direct access to CCO services.

For service and support for a product purchased directly from Cisco, use CCO.

Software Configuration Tips on the Cisco Technical Assistance Center Home Page

If you have a CCO login account, you can access the following URL, which contains links and tips on configuring your Cisco products:

http://www.cisco.com/kobayashi/serv_tips.shtml

This URL is subject to change without notice. If it changes, point your Web browser to CCO and click on this path: **Products & Technologies: Products: Technical Tips**.

The Technical Tips page provides the following sections:

- Configuration Cookbooks—Contains common configurations or recipes for configuring various access routes and dial technologies.

- Field Notices—Notifies you of any critical issues regarding Cisco products and includes problem descriptions, safety or security issues, and hardware defects.

- Frequently Asked Questions—Describes the most frequently asked technical questions about Cisco hardware and software.

- Hardware—Provides technical tips related to specific hardware platforms.

- Hot Tips—Describes popular tips and hints gathered from the Cisco Technical Assistance Center (TAC). Most of these documents are available from the TAC Fax-on-demand service. To reach Fax-on-demand and receive documents at your fax machine from the United States, call 888 50-CISCO (888 502-4726). From other areas, call 650 596-4408.

- Internetworking Features—Lists tips on using and deploying Cisco IOS software features and services.

- Sample Configurations—Provides actual configuration examples that are complete with topology and annotations.

- Software Products—Contains Cisco IOS Software Bulletins, Cisco TCP/IP Suite 100, General Cisco IOS, Internet/Intranet Applications and Software, Network Management, Network Protection Software Tips, and WAN Switching Products and Software.

- Special Collections—Lists other helpful documents, including Case Studies, References & Request for Comments (RFCs), and Security Advisories.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: http://www.cisco.com

- WWW: http://www-europe.cisco.com

- WWW: http://www-china.cisco.com

- Telnet: cco.cisco.com

- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at http://www.cisco.com, http://www-china.cisco.com, or http://www-europe.cisco.com.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 19.